Budgeting and Planning

Developed by: Alberto Escudero Pascual, IT +46
Goals

To understand that:

- A **budget** is not “just” a request for funding
- A **good plan** needs a good budget
- A **good** budget shows that you have a **good** plan
The goals are NOT

- To present the budget for your implementation
- To provide the plan for your implementation
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Viability study

- What physical infrastructure is available?
- What technical infrastructure is already in use?
- Where is the closest point of presence for power/energy?
- Where is the closest point of presence for Internet?
- Weather conditions and terrain
- Accessibility for transport
- Legislation (radio/tower)
Existing Physical Infrastructure

- Many existing sites?
  - Measurements (SNR)
- Measure distance to other point(s)
  - GSM, map, car
- Equipment to bring
  - Binoculars (line-of-sight), digital camera
  - Torch or blinking lamp
  - Adequate clothes, rope, climbing gear, helmet
Existing Technical Infrastructure

• Existing wireless infrastructure
• Existing antennas and cabling
• Other equipment on site
• Frequencies/channels
• Radio power
Access to Power/Energy

• Distance to closest power grid
  – Dig and hook on
  – Permission

• Wind or solar cells
  – Installation and transport
  – Yearly maintenance cost
Internet Connectivity

• Wired versus Wireless
  – Price vs performance

• Optical fiber or twisted pair
  – Protection (PVC)
  – Water tightness
Hardware Budgeting

- Case study included
  - Radio and networking hardware
- Other relevant issues for budgeting
Hardware Budgeting

- Stable source of electricity (UPS)
- Electrical grounding and lightening protection
  - Direct and indirect hits
- Practical tools
  - Climbing gear, walkie-talkie, ladders, backpackers, GPS equipment, maps, trip-meter, binoculars, blinking lamp or torch, ropes, tape and a standard tool box
- Local Transport
Licenses and Permissions

• Permission to build tower (see “Communication Tower”)
  – Owner of house/tower/plot
  – Authority handling regulations of airspace

• Permission to operate IEEE 802.11
  – Unlicensed (license free within limits)
  – License is required
Licenses and Permissions

- “Unlicensed” implies that no license is needed
- “Unlicensed” does not imply unregulated
  - The maximum power output is regulated
- Regulations varies from country to country.
- Typically “Commission for Communication” handles the licenses
Licenses and Permissions

Fees to operate “IP Protocol Services” in Tanzania

<table>
<thead>
<tr>
<th>Fee</th>
<th>Commercial use</th>
<th>Closed Group *</th>
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</thead>
<tbody>
<tr>
<td>Application fee</td>
<td>65 USD</td>
<td>50 USD</td>
</tr>
<tr>
<td>Initial fee</td>
<td>1 000 USD</td>
<td>300 USD</td>
</tr>
<tr>
<td>Annual fee</td>
<td>5 000 USD</td>
<td>200 USD</td>
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</tbody>
</table>

* Closed groups are defined as Governmental departments, Health care and Community Centers

Source: Tanzanian Communication Commission [http://www.tcc.or.tz], 2005
Procurement of Equipment

• Local purchase
  – Heavy and bulky items

• Import
  – Transport and Insurance
  – Pre-shipment inspection
  – Import duty
  – Clearance of goods (clearance agent)
  – Delivery time
Implementation Phase

• Before you start:
  – Equipment procured and delivered
  – Licenses and permissions obtained and paid

• Time for implementation (weather conditions)

• Project team (experience)
General about Contracts

• Delivery time
• Transport
• Testing
• Warranty
• Currency
Public Tenders

- Prepare a good specification in advance
- Specify what you want and you do not want
- Let someone with experience review your specification. Bring outsiders in the process
- Do not forget: testing and evaluation
- Expect quality, Demand quality!
Quality Assurance

- Test and label the equipment
- Check the specifications
- What do you want? How can you measure it?
- What can you guarantee?
- Who is going to be blamed?
Conclusions

• You do not need to be a genius to plan and budget for a wireless implementation, just realistic and a bit “pessimistic”

• A good implementation plan from the beginning will save you lots of trouble (and money) at the end of the project

• Budget also for bringing Internet and electricity to the place, licenses, lightening protection, transport and tools

• A budget on its own is not a good plan. But a good plan has a good and detailed budget.